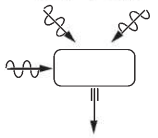
SERVICE MANUAL

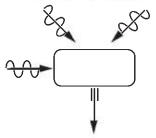
AIR TO WATER HEAT PUMP
MONOBLOC TYPE

WPYA100LA
WPYA080LA

CONTENTS

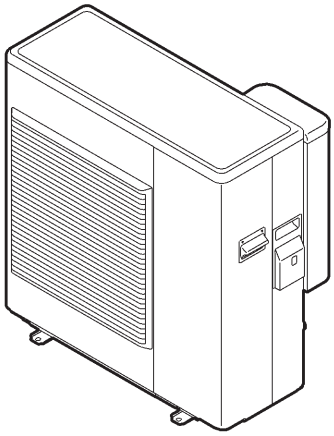
		Unit	WPYA100LA
Cooling Capacity		kW	7.1
Heating Capacity		kW	10.0
Power source		phase	Single
		V	230
		Hz	50
Airflow Method		OUTLET INTAKE	TOP VIEW 
Electrical Data	Input	W	Cooling ; 2060 Heating ; 2300
	Running Current (MAX.)	A	Cooling ; 9.2(14.5) Heating ; 10.2(18.3)
Water Pipe Size			Out ; R1(25A) Return ; R1(25A)
Power Cord	Number of core-wire		core-wire / 3.5~4.0mm^2
Dimensions	Height	mm	881.5
	Width	mm	850
	Depth	mm	330
Net Weight		kg	82
Air Circulation	Type		Propeller Fan
	Motor Type		DC brushless (8-pole)
	Rated Output	W	100
Heat Exchanger			Plate fin configuration,forced draft 18.1 FPI
Refrigerant Control Device			Expansion Valve
Refrigerant (R410A)		g	1500
Thermostat			Electronic Control

• Specifications are subject to change without notice.

		Unit	WPYA080LA
Cooling Capacity		kW	6.4
Heating Capacity		kW	8.0
Power source		phase	Single
		V	230
		Hz	50
Airflow Method		OUTLET / INTAKE	TOP VIEW 
Electrical Data	Input	W	Cooling ; 1780 Heating ; 1780
	Running Current (MAX.)	A	Cooling ; 8.0(13.1) Heating ; 8.0(16.1)
Water Pipe Size			Out ; R1(25A) Return ; R1(25A)
Power Cord	Number of core-wire		core-wire / 3.5~4.0mm^2
Dimensions	Height	mm	881.5
	Width	mm	850
	Depth	mm	330
Net Weight		kg	82
Air Circulation	Type		Propeller Fan
	Motor Type		DC brushless (8-pole)
	Rated Output	W	100
Heat Exchanger			Plate fin configuration,forced draft 18.1 FPI
Refrigerant Control Device			Expansion Valve
Refrigerant (R410A)		g	1500
Thermostat			Electronic Control

• Specifications are subject to change without notice.

UNIT



Operation mode

Cold water mode.
Hot water mode.

Inverter control

Inverter control reduce the ON/OFF times of compressor, so can keep the water temperature changeless during operation.

Electricity consumption

Inverter control can operate with less electricity consumption than normal air to water heat pump.

Defrost control

Defrosting operation is controlled by the temperature of outdoor heat exchanger sensed by the thermistor.

Anti-freezing control for the circulation water

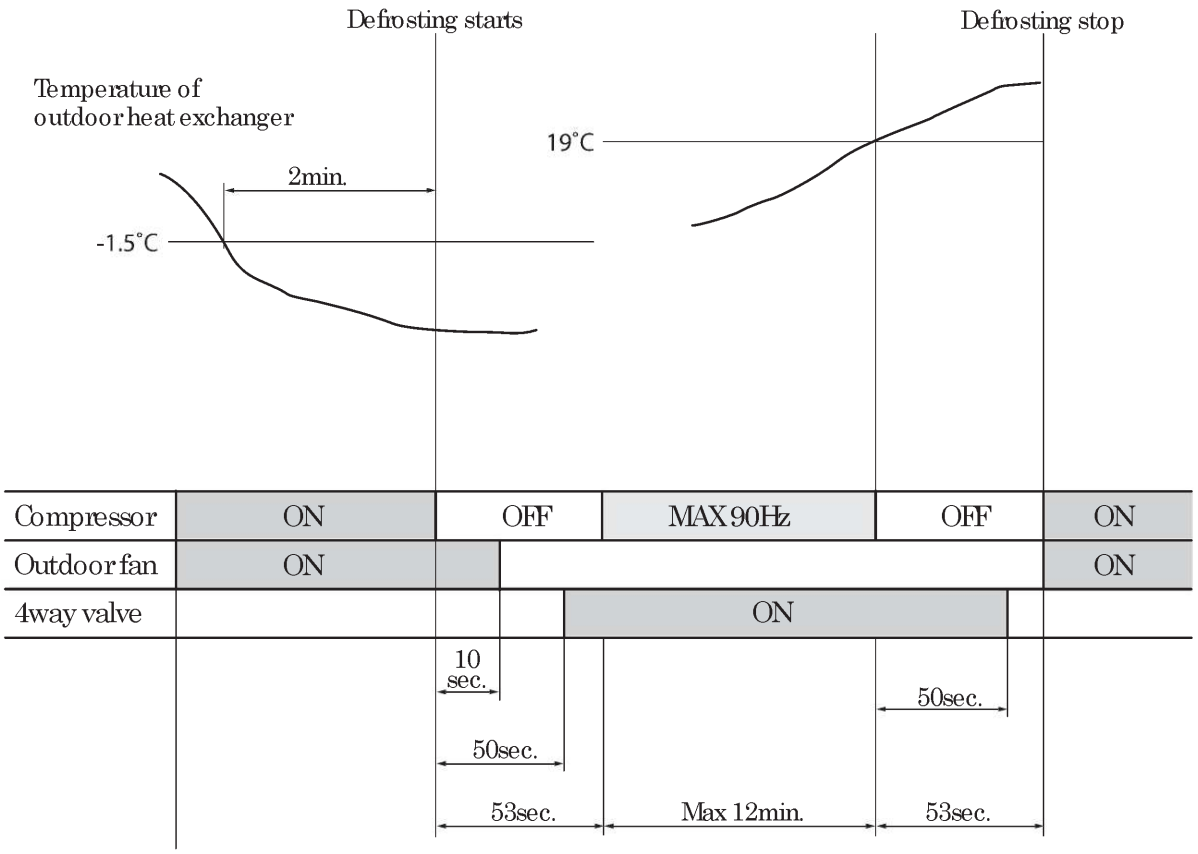
Anti-freeze operation automatically starts when the outdoor temperature is lower than 2°C.

Time delay safety control

Restarting is inhibited for approximately 3 minutes.

DEFROSTING OPERATION(FOR A UNIT HEAT EXCHANGER)

- Defrosting operation is controlled by the temperature of outdoor heat exchanger sensed by the thermistor and the timer switch.
- Defrosting operation starts when the both of the following conditions are met at the same time.
  a)35 minutes' of continuous run of the compressor after the start of heating operation or after the completion of previous defrosting operation.
  b)The temperature of the outdoor heat exchanger stays lower than -1.5°C continuously for two minutes.
- Defrosting operating is called off if either of the following conditions is met.
  a)The temperature of outdoor heat exchanger rises to 19°C while 4-way-valve is ON.
  b)12 minutes has passed since compressor turned ON.



- **Working condition of frost protection heater for expansion** vessel

The heater turns ON if the outdoor temperature keeps below 3 degree for 1 minute.
The heater turns OFF if the outdoor temperature keeps above 5 degree for 1 minute.

FOR YOUR SAFETY USE

- For the safety and proper use and handling of the product, please read and follow the instructions carefully.
- The meaning of the marks below are as follows.

⚠ Danger	Improper use will cause the significant risk of death or serious injury of the user.
⚠ Warning	Improper use may cause the risk of death or serious injury of the user.

- Please refer the marks below.

⚠	Caution	⚠	High Voltage	⊘	Prohibited
❗	Strict enforcement	⏚	Connect the earthing cable		

	⚠ Danger	
Check Point	• If leakage of refrigerant occur in the installation, ventilate a room. If the leaked refrigerant is exposed fire, poisonous gas may be generated.	❗
	• Boosting capacitor make the control box assembly high voltage. Make the capacitor discharge enough when servicing. Otherwise will be struck by electricity.	⚠
	• Never remodel appliance. Use designated parts or accessories to avoid accidents.	❗
	• In case of gas leakage, not only refill the required amount of the refrigerant gas but also find out the gas leakage point and mend it. If the service work has to be suspended before mending the leakage points, be sure to collect the refrigerant gas in the unit by using pump then fasten the service ports to avoid any further leakage. Poisonous gas may be generated when the leaked refrigerant is exposed to fire.	❗
	• Be sure to change the cable if it is damaged. Do not use damaged cable.	❗
	• Do not use power supply cord extended or connected in halfway.	⊘
	⚠ Warning	
Check Point	• Be sure to put the units to earthing works.	⏚
	• Be sure to check the insulated resistance, more than 1MΩ.	

ERROR CODES

The error codes displayed on the unit display board indicate the location of the breakdown or abnormality.

UNIT / ERROR CODES	APPEARANCE, PORTION, PARTS SEEMED WRONG		METHOD OF CHECK
—	—	POWER SUPPLY	check the power supply
		FUSE CF3 (250V T5A)	check the electric continuity by tester [see fig. 1]
		FUSE CF1 (250V T25A)	check the electric continuity by tester [see fig. 1]
A0	accident of DC voltage	FAN MOTOR	take off the connector [9], and check the resistance between red-black in the connector if the resistance is over 100kΩ, FAN MOTER is normal
		POWER MODULE	take off the terminals (orange and blue) and check the resistance between orange-blue if the resistance is over 100kΩ, POWER MODULE is normal
		POWER SUPPLY	check the power supply
A1	accident of dischage temperature	SENSOR, TEMP. DISCHARGE	check the resistance by tester [see table 2]
		SENSOR, TEMP. SUCTION	check the resistance by tester [see table 1]
		GAS LEAKAGE	check the service valve and refrigerant circuit (pipe)
A2	protective action against excess current DC current detection	UNREASONABLE OPERATION UNDER OVERLOAD	check the place of installation (blockage of air inlet & outlet) check the excess gas
		DROP OF POWER VOLTAGE	check the power voltage (230V)
		POWER MODULE	operate without the junction connector of compressor lead wire →if the error code is same, POWER MODULE should be replaced
		FUSE CF2 (250V T15A)	check the electric continuity FUSE CF2 (250V T15A) by tester
		COMPRESSOR	other than described above
A3	CT disconnection	PCB (CONTROLLER)	change the PCB (CONTROLLER)
A4	protective action against excess current AC current detection	UNREASONABLE OPERATION UNDER OVERLOAD	check the place of installation (blockage of air inlet & outlet) check the excess gas
		DROP OF POWER VOLTAGE	check the power voltage (230V)
		MOMENTARY STOP OF POWER (IN CASE OF LIGHTNING)	check the movement by reoperation
A5	abnormal revolution of compressor	UNREASONABLE OPERATION UNDER OVERLOAD	check the place of installation (blockage of air inlet & outlet) check the excess gas
		DROP OF POWER VOLTAGE	check the power voltage (230V)
		FUSE CF2 (250V T15A)	check the electric continuity FUSE CF2 (250V T15A) by tester
		POWER MODULE	check the resistance of POWER MODULE by tester take off the junction connector of compressor lead wire measure resistance between the connector pins of junction connector, six times between white-black, black-red, red-white respectively by changing the polarity →if all the figures show over 100kΩ, POWER MODULE is normal
		COMPRESSOR	other than described above
A6	accident of SENSOR	SENSOR, TEMP. SUCTION	check the resistance by tester [see table 1]
A7	accident of SENSOR	SENSOR, TEMP. DEFROST	check the resistance by tester [see table 1]
A8	accident of SENSOR	SENSOR, TEMP. DISCHARGE	check the resistance by tester [see table 2] (*2)
C0	accident of POWER MODULE	POWER MODULE	POWER MODULE should be replaced
C2	accident of SENSOR	SENSOR, TEMP. OUTDOOR	check the resistance by tester [see table 1]
C3	accident of FAN MOTOR	FUSE CF4 (250V T3.15A) FAN MOTOR (*1)	check the electric continuity FUSE CF4 (250V T3.15A) by tester →if it is continuity, check the voltage of FAN MOTOR →if the voltage is nomal, FAN MOTOR should be replaced [see fig. 2]
		PCB (CONTROLLER)	PCB (CONTROLLER) should be replaced
C4	rise of temperature (above 110°C) of POWER MODULE	MIS-INSTALLATION	check the place of installation (blockage of air inlet & outlet)
		SENSOR, TEMP. POWER MODULE	POWER MODULE should be replaced
C5	accident of SENSOR	SENSOR, TEMP. POWER MODULE	POWER MODULE should be replaced
C6	accident of PCB (CONTROLLER)	PCB (CONTROLLER)	PCB (CONTROLLER) should be replaced
C7	I/F PCB serial error	MIS-WIRING [PCB (CONTROLLER) - I/F PCB CONNECTING CABLE] OR RARE CONTACT	check the wiring connection and rare contact
		I/F PCB	I/F PCB should be replaced
		PCB (CONTROLLER)	PCB (CONTROLLER) should be replaced

(*1) When checking fan motor and/or pump, turn off the power supply completely and tatch their terminal or connector
(*2) In case of detecting the open circuit of the discharge temperature thermistor, error display appears 10 minutes after start operating.
In case of detecting the short circuit of the discharge temperature thermistor, error display appears immediately.

ERROR CODES

UNIT / ERROR CODES	APPEARANCE, PORTION, PARTS SEEMED WRONG		METHOD OF CHECK
C8	Inverter PCB serial error	CONNECTOR 13 is RARE CONTACT or POWER MODULE and PCB(CONTR-OLLER)	Turn off the power supply , wait for about 3 minutes take off and insert the connector 13, and then power up again
			POWER MODULE or PCB(CONTROLLER) should be replaced
CC	Siemens PCB serial error	MIS-WIRING (I/F PCB-SIEMENS CONTRO-LLER) OR RARE CONTACT	check the wiring connection and rare contact
		I/F PCB	I/F PCB should be repleced
		SIEMENS CONTROLLER	Siemens controller should be replaced
E4	accident of SENSOR	SENSOR, TEMP. OUTGOING CIRCULATING WATER	check the resistance by tester [see table 1]
E5	accident of SENSOR	SENSOR, TEMP. RETURN CIRCULATING WATER	check the resistance by tester [see table 1]
P1	accident of PUMP	PUMP (*1)	check the voltage of PUMP [see fig. 3] →if the voltage is nomal, PUMP should be replaced
		PCB (CONTROLLER)	PCB (CONTROLLER) should be replaced
		CLOGGED THE CIRCULATION PUMP AND /OR HEATING CIECUIT	check the pump and heating circuit
U5	low-outside air temperature limit	THE OUTDOOR TEMP. FALLS BELOW -20°C	below -20°C, it is likely not to operate for the protection of the equipment when the temperature rises, the unit automatically re-starts the operation
		SENSOR TEMP. OUTDOOR	check the resistance by tester [see table 1]
not cool down not warm up		4-WAY VALVE	check the resistance by tester [see fig. 4]
		SHORT CYCLE (INSUFFICIENT AIR CIRCULATION)	check the blockage of air inlet & outlet
		SENSOR,TEMP. OUTGOING AND RETURN CIRCULATING WATER	check the resistance by tester [see table 1]
		GAS LEAKAGE	check the service valve and refrigerant circuit (pipe)
		CLOGGED HEATING CIRCUIT	check temperature difference heating flow/return large difference meens flow rate is too low

(*1) When checking fan motor and/or pump, turn off the power supply completely and tatch their terminal or connector

ELECTRIC CHARACTER

[table 1] Sensor, temp. defrost
Sensor, temp. outdoor
Sensor, temp. suction
Sensor, temp. outgoing
and return circulating water

Temp.(°C)	Resistance(kΩ)
0	31
5	24
10	19
15	15
20	12
25	10
30	8
35	6.7
40	5.5
45	4.6
50	3.8
55	3.2

[table 2] Sensor, temp. discharge

Temp.(°C)	Resistance(kΩ)
10	1,000
20	600
35	300
40	250
50	160
80	50

DISPLAY OF ERRORS IN THE PAST

1. Display method

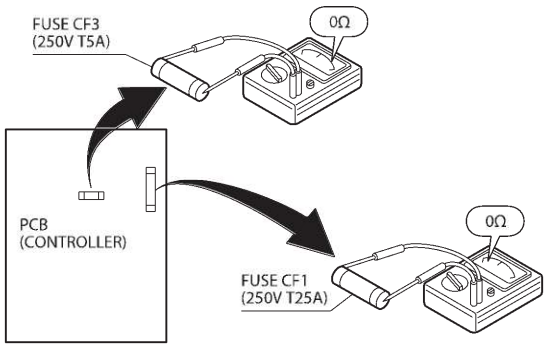
- For a unit display board
  Press and hold the PUMP SW. and RESET SW. at the same time for 5 seconds to display a past error code and its sequence number.
  The PUMP SW. can then be used to select between a maximum of 8 past error codes to display. (If there are no error codes, "- - " is displayed.)

2. Display cancellation

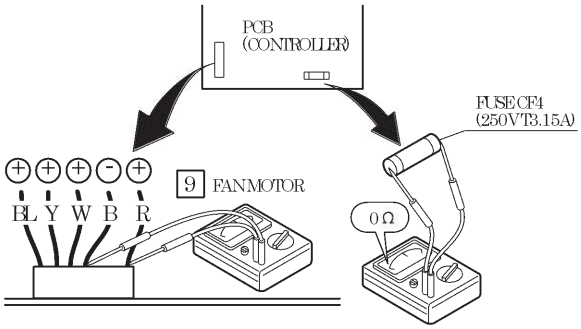
- For a unit display board
  While an error code is being displayed, press and hold the PUMP SW. and RESET SW. at the same time for 5 seconds to cancel the error code display and turn off the display.
  Alternatively, if no operations are performed for 5 minutes, the error code display is automatically cancelled and the display turned off.
  While an error code is being displayed, press and hold the reset switch for 10 seconds or more to delete all past error codes. The display turns to "- - ".

CHECK FOLLOWING STEPS

[fig. 1] Continuity of current fuse on the PCB(CONTROLLER)



[fig. 2] Voltage of fan motor on the PCB(CONTROLLER)

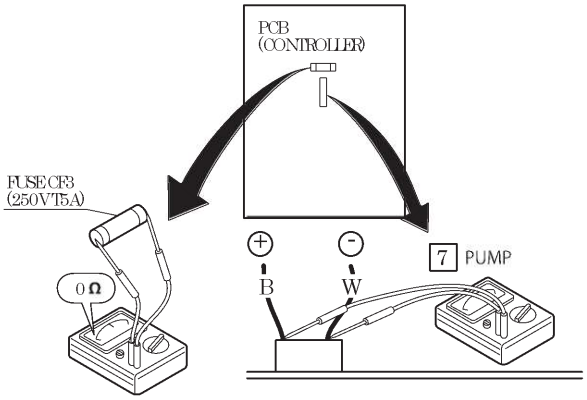


Measure voltage between the connector pins of connector 9. Connector 9 shall be checked during heating or cooling operation.
Measure voltage as follows without taking off the connector 9.

between red ⊕ and black ⊖ approx. DC200~370V
between yellow ⊕ and black ⊖ approx. DC3~7V
between white ⊕ and black ⊖ approx. DC15V
] PCB (CONTROLLER) is Normal

→ accident of FAN MOTOR

[fig. 3] Voltage of PUMP on the PCB(CONTROLLER)

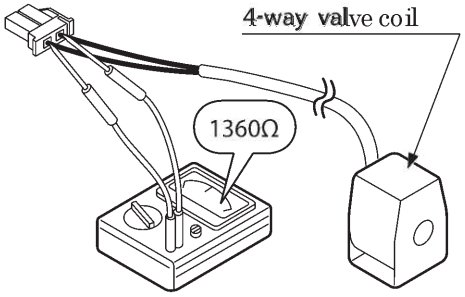


Measure voltage between the connector pins of connector 7. Connector 7 shall be checked during heating or cooling operation.
Measure voltage as follows without taking off the connector 7.

between black ⊕ and white ⊖ approx. AC207~253V
] PCB (CONTROLLER) is Normal

→ accident of PUMP

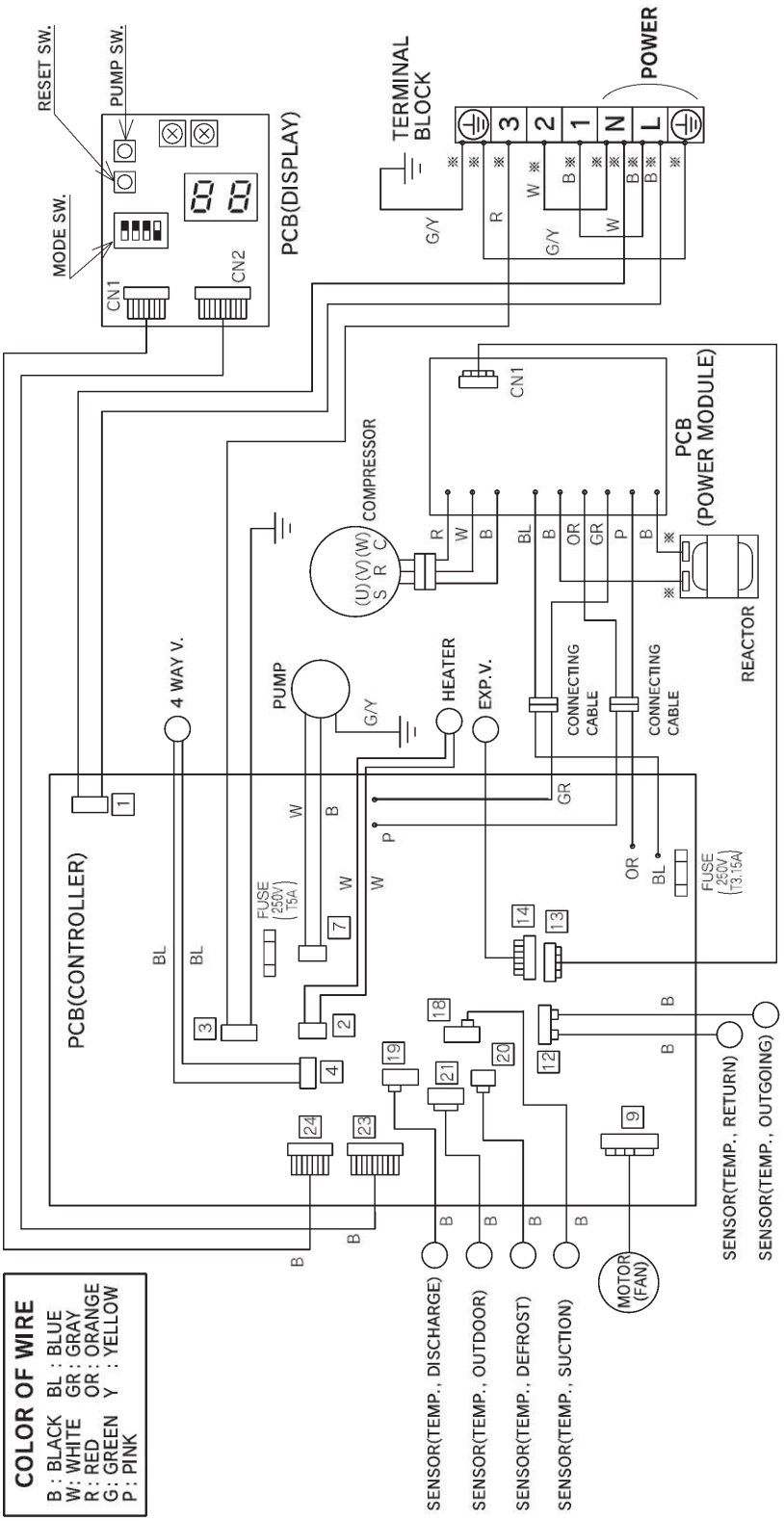
[fig. 4] Resistance of 4-way valve coil



Take off the connector and check the resistance 4-way valve coil.

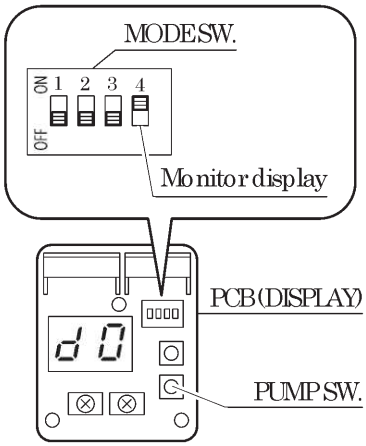
WIRING DIAGRAM

WPYA100LA
WPYA080LA



MONITOR DISPLAY METHOD

1. Switch " ON " the MODE SW. 4 on the unit PCB (DISPLAY).
   The monitor number and monitor data are alternately displayed.
2. Push the PUMP SW. of the unit PCB (DISPLAY).
   Every time the PUMP SW. is pressed the display changes in the sequence below.
3. Switch " OFF " the MODE SW. 4 after completing the check.

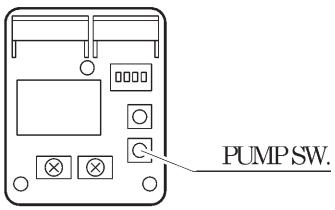


• Monitor display contents

Monitor	Monitor data display contents	
d0	Circulating water return temperature	Units of 1°C
d1	Compressor operating frequency	Units of 1Hz
d2	Discharge temperature	Units of 1°C
d3	Power consumption value	Units of 100W
d4	Interface voltage	Units of 0.1V
d5	————	
d6	Ambient air temperature	Units of 1°C
d7	External thermistor temperature	Units of 1°C
d8	Suction temperature	Units of 1°C
d9	Circulating water outgoing temperature	Units of 1°C

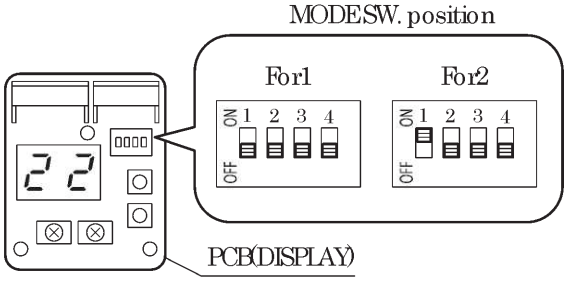
CHARGE THE CIRCULATION WATER AND AIR PURGE IN WATER CIRCUIT

- **When you push PUMP SW on display PCB, the water pump is started** to operate to circulate the water.
  The each digital segment of right side on display PCB lights in sequence during operating the pump.
- **The pump is automatically stopped after operating for 10 minutes.**
  If it is not enough to let the air out of water circuit, please push PUMP SW once again after the pump stopped.
  When you would like to stop operating the pump before the pump is automatically stopped, please push PUMP SW once again.



FREEZE PREVENTION SETTING

- If the outside temperature falls below about 2°C, freeze prevention operation is possible depending on the unit MODE SW. 1
  OFF : 1. No freeze prevention operation (When using anti-freeeze)
  ON : 2. Freeze prevention operation (When the outdoor temperature falls below about 2°C, the circulating water is warmed and circulated.)
  The factory setting is " ON : 2. Freeze prevention operation ".



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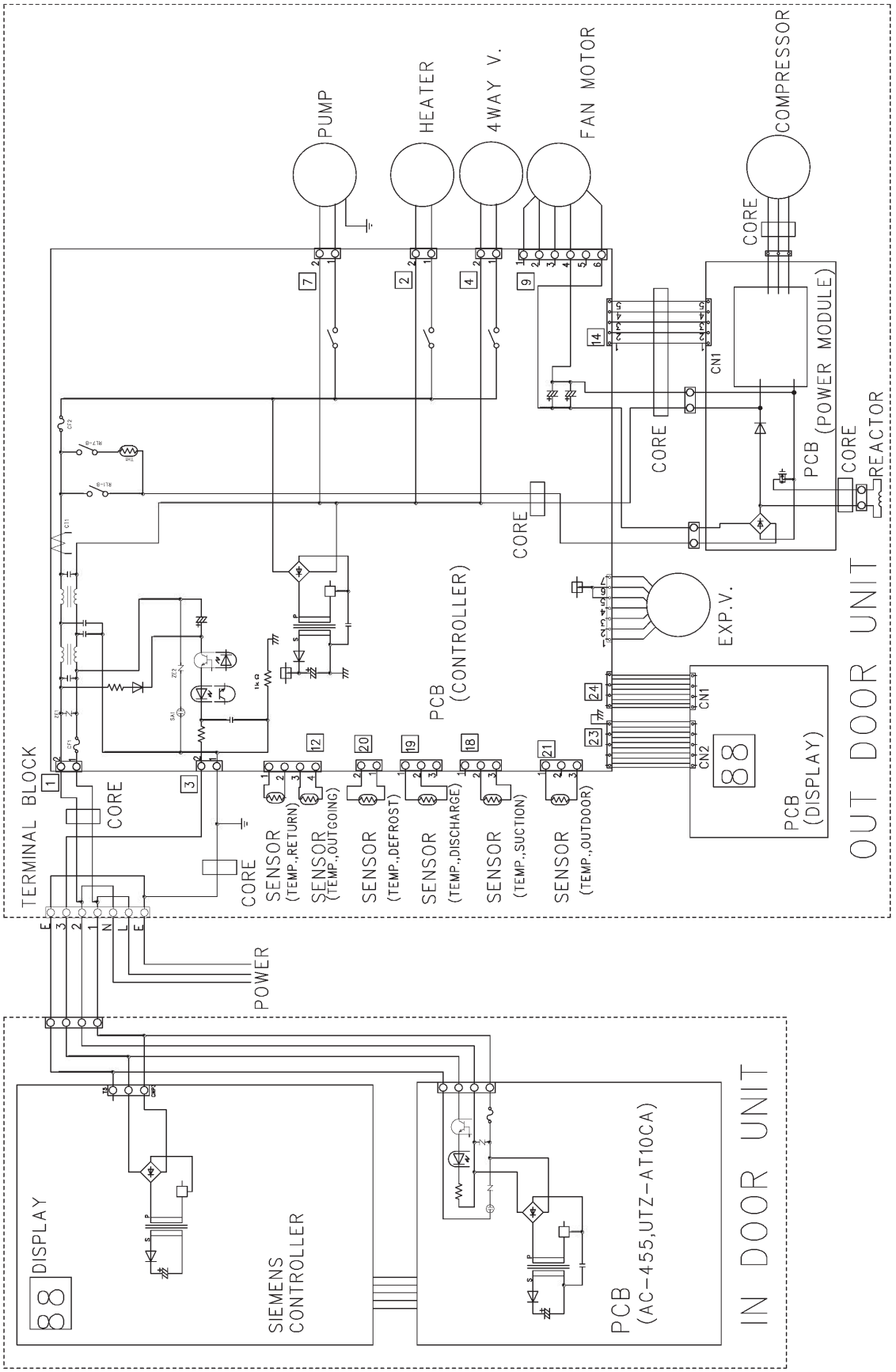

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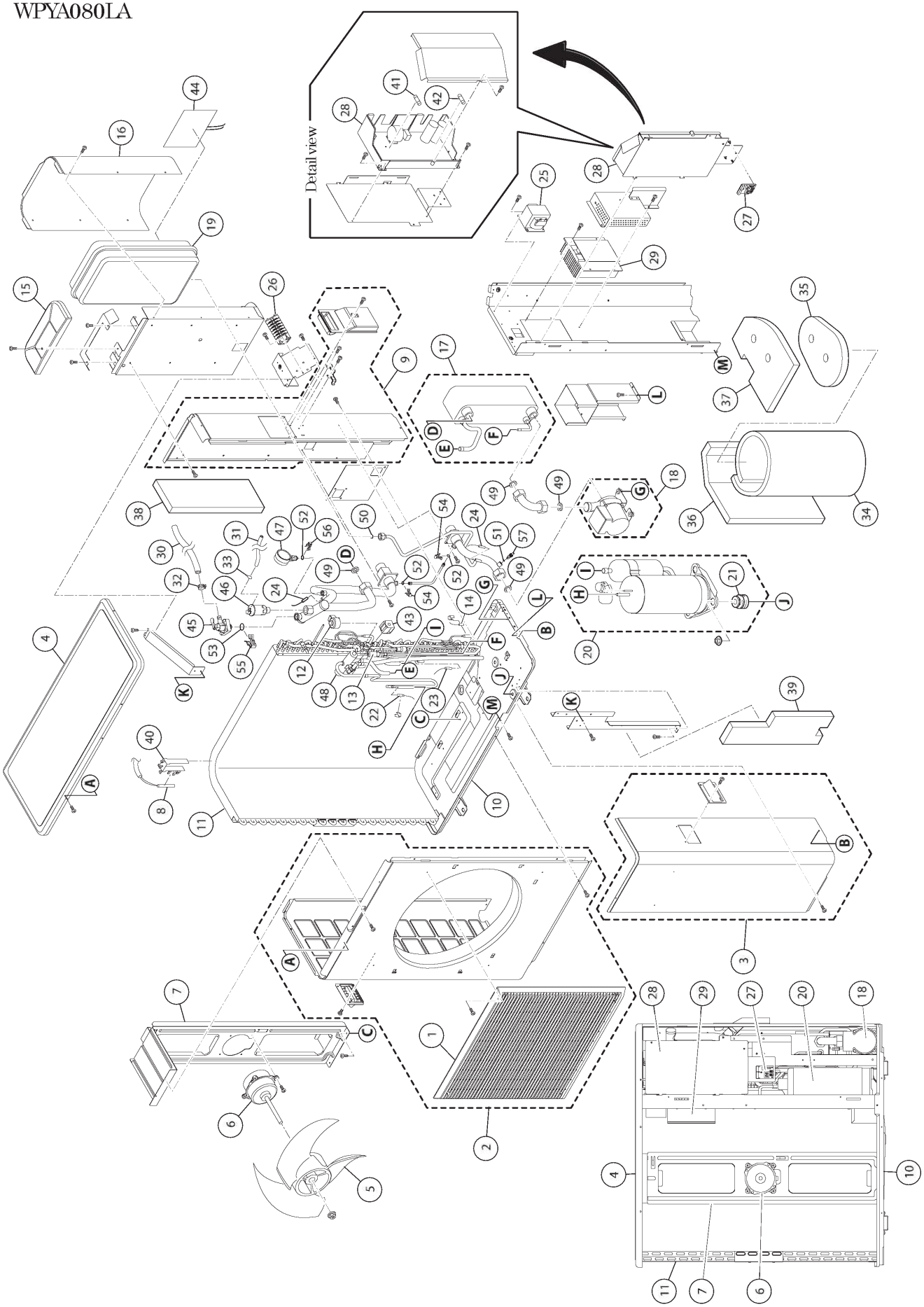

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No.	PARTS NAME	PARTS No.
1	OUTLET GRILLE	30112520
2	FRONT PANEL ASSY.(LEFT)	20600350
3	FRONT PANEL ASSY.(RIGHT)	20600380
4	TOP PANEL ASSY.	20600401
5	PROPELLER FAN	52630190
6	MOTOR	30112580
7	BRACKET,MOTOR	20605280
8	SENSOR (TEMP.OUTDOOR)	30114360
9	BACK PANEL ASSY.	20600421
10	BOTTOM PANEL ASSY.	20600441
11	CONDENSOR ASSY.	20605621
12	COIL,EXPANSION VALVE	51914531
13	EXPANSION VALVE	30112630
14	SENSOR (TEMP.DEFROST)	30114350
15	TANK COVER (TOP)	20605930
16	TANK COVER (SIDE)	20605920
17	HEAT EXCHANNGER ASSY.	20606791
18	PUMP ASSY.	20605960
19	TANK	30112640
20	COMPRESSOR	30113070
21	VIBRATION PROOF RUBBER	30001110
22	SENSOR (TEMP.DISCHARGE)	51100870
23	SENSOR (TEMP.SUCTION)	30089900
24	SENSOR (TEMP.CIRCULATING WATER)	30112980
25	REACTOR	30112530
26	TERMINAL BLOCK	30112970
27	PCB (DISPLAY)	30051560
28	PCB (CONTROLLER) with CASE (WPYA100LA)	30112540+20605320
	PCB (CONTROLLER) with CASE (WPYA080LA)	30116780+20605320
29	PCB (POWER MODULE) ASSY. WITH HEAT SINK	20605341
30	RUBBER HOSE (FOR RELEIF VALVE)	30114420
31	RUBBER HOSE (FOR AIR PURGE VALVE)	30114430
32	HOSE BAND (FOR RELIEF VALVE)	30084480
33	HOSE BAND (FOR AIR PURGE VALVE)	68616090
34	SOUND PROOF MATERIAL1	20611960
35	SOUND PROOF MATERIAL2	20611970
36	SOUND PROOF MATERIAL3	20611980
37	SOUND PROOF MATERIAL4	20611990
38	SOUND PROOF MATERIAL5	20612000
39	SOUND PROOF MATERIAL6	20612010
40	OUTDOOR THERMISTOR HOLDER	20040100
41	FUSE(5A)	40016410
42	FUSE(3.15A)	40016400
43	COIL, 4-WAY VALVE	30112610
44	TANK HEATER	30114370
45	RELIEF VALVE	30112670
46	AIR PURGE VALVE	30112680
47	PRESSURE GAUGE	30112690
48	4-WAY VALVE	30104090
49	PACKING B	30113030
50	PACKING C	30113060
51	O RING (P4)	01107120
52	O RING (P6)	01107600
53	O RING (P14)	01107150
54	QUICK FASTENER	52775700
55	QUICK FASTENER	00633600
56	QUICK FASTENER	00601690
57	DRAIN PLUG	30078010

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